

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2017****Subject Code: 2170701****Date: 02/11/2017****Subject Name: Compiler Design****Time: 10:30 AM TO 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

		MARKS
Q.1	(a) What is the difference between compiler and interpreter?	03
	(b) Explain analysis phase of the source program with example.	04
	(c) Write an algorithm for Thompson's construction method. Apply the algorithm to construct NFA for following regular expression. $(a   b)^*abb$ .	07
Q.2	(a) What is a pass in a compiler? What is the effect of reducing the number of passes?	03
	(b) Explain error recovery strategies used by parser.	04
	(c) What is operator grammar? Generate precedence function table for following grammar. $E \rightarrow EAE   id$ $A \rightarrow +   *$	07
	<b>OR</b>	
	(c) Define handle and handle pruning. Explain the stack implementation of shift reduce parser with the help of example.	07
Q.3	(a) Give the translation scheme that converts infix to postfix notation. Generate the annotated parse tree for input string 3-5+4.	03
	(b) Explain buffer pairs and sentinels.	04
	(c) Check given grammar is LL(1) but not SLR(1). $S \rightarrow AaAb   BbBa$ $A \rightarrow \epsilon$ $B \rightarrow \epsilon$	07
	<b>OR</b>	
Q.3	(a) Write a rule of Left factoring a grammar and give example.	03
	(b) Explain role of lexical analyzer.	04
	(c) Define syntax tree. What is s-attributed definition? Explain construction of syntax tree for the expression $a-4+c$ using SDD.	07
Q.4	(a) Translate the arithmetic expression $a^*(b+c)$ into 1. Syntax tree 2. Postfix notation 3. Three address code	03
	(b) Write Syntax Directed Definition to produce three address code for the expression containing the operators $:=, +, -, (unary\ minus), ( )$ and $id$ .	04
	(c) What is activation record? Explain stack allocation of activation records using example.	07
	<b>OR</b>	
Q.4	(a) What is activation tree?	03
	(b) Explain parameter passing techniques for procedure.	04
	(c) What is importance of intermediate code? Discuss various representations of three address code using the given expression. $a = b * -c + b * -c$ .	07





- Q.5 (a) Explain three loop optimization techniques with example. **03**  
(b) What is code optimization? Explain data flow equation. **04**  
(c) Describe code generator design issues. **07**

**OR**

- Q.5 (a) Define following : DAG, Basic Blocks, Flow graph **03**  
(b) Explain peephole optimization. **04**  
(c) Explain function preserving transformations with example. **07**

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